

TEST REPORT

Product Name : Smart Lock U300

Model Number : DL-D02E, DL-D02D

Prepared for : Lumi United Technology Co., Ltd
Address : Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

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Date of issue : May 30, 2024



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TEST REPORT DESCRIPTION

Applicant : Lumi United Technology Co., Ltd

Manufacturer : Lumi United Technology Co., Ltd

EUT : Smart Lock U300

Model : DL-D02E, DL-D02D

Trademark : Aqara

Test Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
EN IEC 62311: 2020	PASS
AS/NZS 2772.2:2016 Amd 1:2018	PASS

EN IEC 62311: 2020

The device described above is tested by EMTEK(DONGGUAN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report shows the EUT to be technically compliant with the EN 62311: 2020 requirements. The test results are contained in this report and EMTEK(DONGGUAN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK(DONGGUAN) CO., LTD.

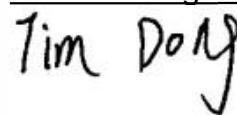
Date of Test :

April 30, 2024 to May 30, 2024



Prepared by :

Warren Deng /Editor



Reviewer :

Tim Dong /Supervisor

Approved & Authorized Signer :



Sam Lv / Manager

Modified History

Version	Report No.	Revision Date	Summary
	EDG2404300196E00107R	/	Original Report

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	: Smart Lock U300
Model Number	: DL-D02E, DL-D02D All models are the same, except the model name. Here, DL-D02E is selected to test all the test items.
Input	: DC 6V from battery DC 5V from USB
Applicant	: Lumi United Technology Co., Ltd
Address	: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Manufacturer	: Lumi United Technology Co., Ltd
Address	: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Date of Test	: April 30, 2024 to May 30, 2024

1.2 Test Facility

Site Description

- EMC Lab. : Accredited by CNAS, 2020.08.27
The certificate is valid until 2024.07.05
The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2018
The Certificate Registration Number is L3150
- Accredited by FCC
Designation Number: CN1300
Test Firm Registration Number: 945551
- Accredited by A2LA, April 05, 2021
The Certificate Registration Number is 4321.02
- Accredited by Industry Canada
The Certificate Registration Number is CN0113
- Name of Firm : EMTEK (DONGGUAN) CO., LTD.
Site Location : -1&2/F.,Building 2, Zone A, Zhongda Marine Biotechnology Research
and Development Base, No.9, Xincheng Avenue, Songshanlu
High-technology Industrial Development Zone, Dongguan, Guangdong,
China

2. GENERAL PRODUCT INFORMATION

2.1 Basic Restriction

The essential requirements of Directive 2014/53/EU in the article 3.1(a) and the limits must be taken from Council Recommendation 99/519/EC for General Population or form the ICNIRP Guidelines for Occupational Exposure. EN 62479:2010 Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields. The average power of EUT is less than 20mW then comply with basic restriction (1999/519/EC) without test.



3. TEST RESULT

3.1. EMF Exposure Measurement

3.1.1 Limit

Basic Restrictions

Council Recommendation 99/519/EC Annex II

Basic restrictions for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz)

Frequency range	Magnetic flux density (mT)	Current density (mA/m ²) (rms)	Whole body average SAR (W/kg)	Localized SAR (head and trunk) (W/kg)	Localized SAR (limbs) (W/kg)	Power density, S (W/m ²)
0Hz	40	-	-	-	-	-
>0-1Hz	-	8	-	-	-	-
1-4Hz	-	8/f	-	-	-	-
4Hz-1000Hz	-	2	-	-	-	-
1000Hz-100kHz	-	f/500	-	-	-	-
100kHz-10MHz	-	f/500	0.08	2	4	-
10MHz-10GHz	-	-	0.08	2	4	-
10GHz-300GHz	-	-	-	-	-	10

Note:

1. f is the frequency in Hz.
2. The basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restrictions for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.
3. Because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1 cm² perpendicular to the current direction.
4. For frequencies up to 100kHz, AV current density values can be obtained by multiplying the rms value by $\sqrt{2}$ (=1.414). For pulses of duration tp the equivalent frequency to apply in the basic restrictions should be calculated as $1/(2tp)$.
5. For frequencies up to 100kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.
6. All SAR values are to be averaged over any six-minute period.
7. Localised SAR averaging Mass is any 10g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10g of tissue are intended to be a mass of contiguous tissue

- with nearly homogeneous electrical properties. In specifying a contiguous mass of tissue, it is recognized that this concept can be used in computational dissymmetry but may present difficulties for direct physical measurements. A simple geometry such as cubic tissue mass can be used provided that the calculated dissymmetric quantities have conservative values relative to the exposure guidelines.
8. For pulses of duration t_p the equivalent frequency to apply in the basic restrictions should be calculated $\alpha_n = 1/(2t_p)$. Additionally, for pulsed exposures, in the frequency range 0.3 to 10GHz and for localized exposure of the head, in order to limit and avoid auditory effects caused by thermoplastic expansion, an additional basic restriction is recommended. This is that the SA should not exceed 2mJ kg⁻¹ averaged over 10g of tissue.

Reference Levels

Council Recommendation 99/519/EC Annex III

Reference levels for electric, magnetic and electromagnetic fields (0 Hz to 300GHz)

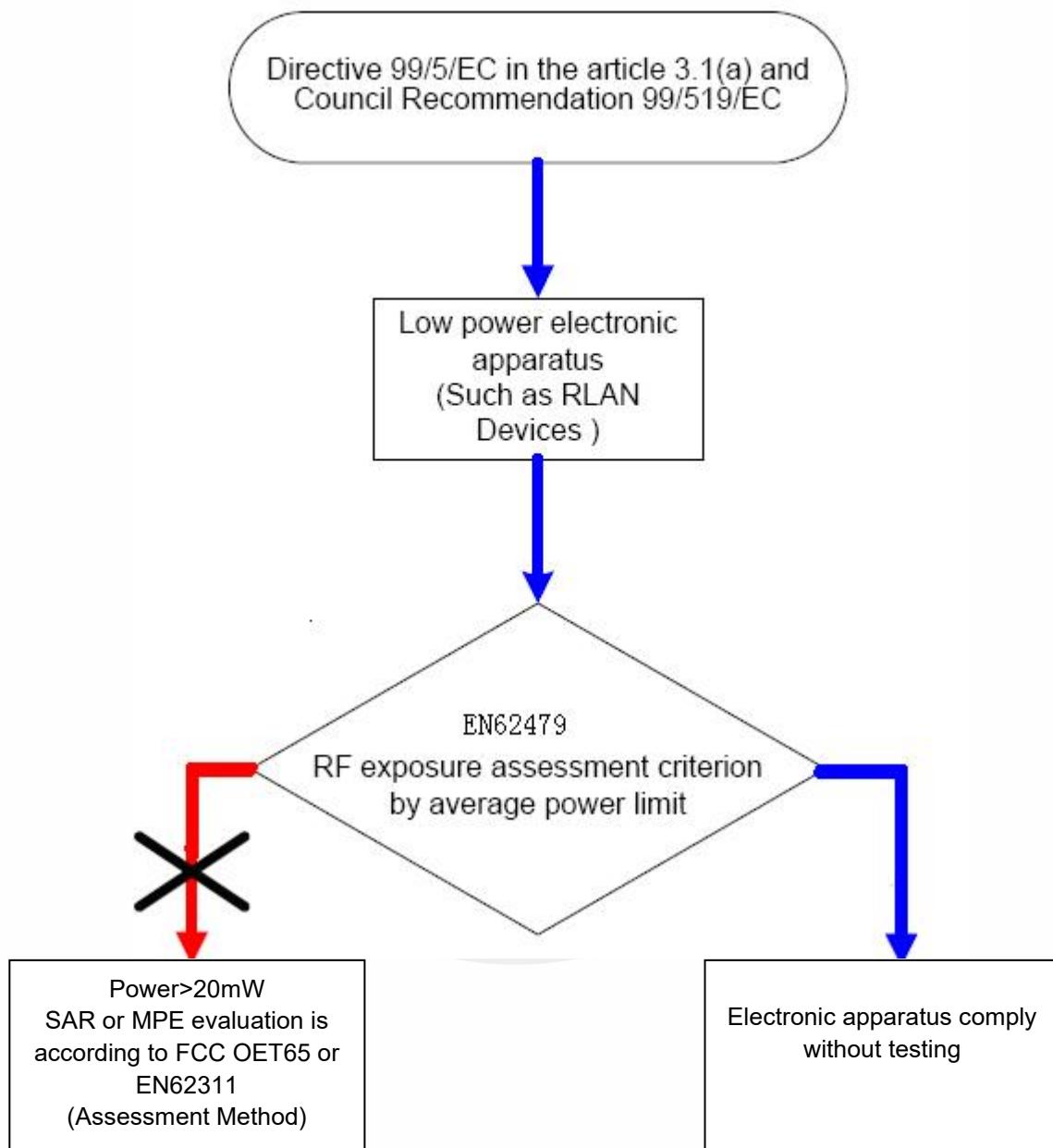
Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μ T)	Equivalent plane wave power density Seq (W/m ²)
0-1 Hz	-	3.2×10^4	4×10^4	-
1-8 Hz	10000	$3.2 \times 10^4/f^2$	$4 \times 10^4/f^2$	-
8-25 Hz	10000	$4000/f$	$5000/f$	-
0.025-0.8 kHz	$250/f$	$4/f$	$5/f$	-
0.8-3 kHz	$250/f$	5	6.25	-
3-150 kHz	87	5	6.25	-
0.15-1 MHz	87	$0.73/f$	$0.92/f$	-
1-10 MHz	$87/f^{1/2}$	$0.73/f$	$0.92/f$	-
10-400 MHz	28	0.073	0.095	2
400-2000 MHz	$1.375 f^{1/2}$	$0.0037 f^{1/2}$	$0.0046 f^{1/2}$	$f/200$
2-300 GHz	61	0.16	0.2	10

Notes:

1. As indicated in the frequency range column.
2. For frequencies between 100kHz and 10 GHz, Seq, E2, H2 and B2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, Seq, E2, H2, and B2 are averaged over any 68/1.05-minute period(in GHz).
4. No E-field value is provided for frequencies <1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.

3.1.2. Evaluation Routine

Low Power Electronic Apparatus for RF exposure evaluation routine



3.1.3. Measurement Result

Magnetic Field (H-Field) strength at 20cm from the boundaries of EUT, and 20cm from the top.

Test Mode: NFC					
		Measuring Distance(cm)	Magnetic Field(A/m)	Limit(A/m)	50% Limit(A/m)
Measurement Point 1	Front	20	0.0105	0.073	0.0365
Measurement Point 2	Back	20	0.0099		
Measurement Point 3	Left	20	0.0094		
Measurement Point 4	Right	20	0.0098		
Measurement Point 5	Bottom	20	0.0091		
Measurement Point 6	Top	20	0.0102		

Electric Field (E-Field) strength at 20cm from the boundaries of EUT, and 20cm from the top.

Test Mode: NFC					
		Measuring Distance(cm)	Electric Field(V/m)	Limit(V/m)	50% Limit(V/m)
Measurement Point 1	Front	20	0.79	28	14
Measurement Point 2	Back	20	0.63		
Measurement Point 3	Left	20	0.65		
Measurement Point 4	Right	20	0.67		
Measurement Point 5	Bottom	20	0.68		
Measurement Point 6	Top	20	0.81		

Magnetic Field (B-Field) strength at 20cm from the boundaries of EUT, and 20cm from the top.

Test Mode: NFC					
		Measuring Distance(cm)	Magnetic Field(μT)	Limit(μT)	50%Limit(μ T)
Measurement Point 1	Front	20	0.0163	0.095	0.0425
Measurement Point 2	Back	20	0.0112		
Measurement Point 3	Left	20	0.0108		
Measurement Point 4	Right	20	0.0117		
Measurement Point 5	Bottom	20	0.0132		
Measurement Point 6	Top	20	0.0159		

Magnetic Field (Equivalent plane wave power density Seq) strength at 20cm from the boundaries of EUT, and 20cm from the top.

Test Mode: NFC					
		Measuring Distance(cm)	Magnetic Field(μT)	Limit(W/m ²)	50%Limit (W/m ²)
Measurement Point 1	Front	20	0.0284	2	1
Measurement Point 2	Back	20	0.0236		
Measurement Point 3	Left	20	0.0237		
Measurement Point 4	Right	20	0.0228		
Measurement Point 5	Bottom	20	0.0231		
Measurement Point 6	Top	20	0.0271		

*** End of Report ***

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